

- 1) claims 1-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over EP 960 873 (hereinafter "Mauro") in view of U.S. Pat. No. 5,681,643 (hereinafter "Noguchi");
- 2) claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi, further in view of U.S. Pat. No. 4,256,493 (hereinafter "Yokoyama");
- 3) claim 7 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi and Yokoyama, further in view of U.S. Pat. No. 4,136,076 (hereinafter "Daniels");
- 4) claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi, further in view of U.S. Pat. No. 6,283,589 (hereinafter "Gelbart");
- 5) claims 9-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi and U.S. Pat. No. 6,106,113 (hereinafter "Yamazaki");
- 6) claim 14 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi and Yamazaki, further in view of Yokoyama; and
- 7) claim 15 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi and Yamazaki, further in view of Daniels.

Claims 16-20 will be cancelled without prejudice upon allowance of the pending claims.

Rejections under 35 U.S.C. 103(a)

The Examiner has rejected all of the claims under 35 U.S.C. 103(a). In every rejection made by the Examiner, Mauro is cited as the primary reference and Noguchi is cited as a secondary reference. All of these rejections are respectfully believed to be based on an erroneous interpretation of the prior art when taken as a whole and applied to the presently claimed invention.

The real issue under § 103 is whether the Examiner has stated a case of *prima facie* obviousness. The test for establishing such a case is well stated in *In re Lintner*, 173 USPQ 560, 562 (CCPA 1972) as follows:

"In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teaching would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination or other modification.

It has been widely recognized that virtually every invention is a combination of elements and that most, if not all, of these will be found somewhere in an examination of the prior art. This reasoning lead the CAFC, in *Connell v. Sears, Roebuck & Co.*, 220 USPQ 193, 199 (CAFC 1983) to state:

"...it is common to find elements or features somewhere in the prior art. Moreover, most if not all elements perform their ordained and expected function. The test is whether the claimed invention as a whole, in light of all the teachings of the references in their entireties, would have been obvious to one of ordinary skill in the art at the time the invention was made."
(underlining added)

When making a rejection under 35 U.S.C. 103, the prior art relied upon must contain some motivation for one skilled in the art to modify or combine references. It is not enough to look at the elements of the invention, i.e., the claims, and find all of

those elements somewhere in the prior art. Further, the proposed modification of prior art must have had a reasonable expectation of success from the perspective of one skilled in the art at the time the invention was made. In other words, the reasonable expectation of success test must be made without hindsight analysis. After considering these points of law, it is the Applicants' assertion that the Examiner has not met this burden with respect to maintaining an obviousness rejection. An explanation of each of these points will follow.

Mauro in view of Noguchi

Claims 1-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi. As the Examiner is aware, the prior art relied upon must contain some motivation for one skilled in the art to modify or combine references. In rejecting claim 1, the Examiner has failed to point to anything in Mauro that would even suggest that a jetting process can be used to apply chromophores to an article for firing. To the contrary, the specification discusses the "thickening" of the compositions to be applied in many places. See para. 0004, 0041, and 0042. Mauro also teaches application of colorant by silk-screening, direct printing, rotogravure. See para. 0019 and Abstract. In one embodiment, the glazed surface is taught to be decorated with one or more silk-screen applications, using known-type inks composed of colorant powders and a traditional medium. Compositions that are applied by silk-screening, standard printing (such as offset printing), or rotogravure are not jettable compositions.

It is important to note that ink-jettable compositions differ substantially from compositions that are applied by other methods. Particulate size, fluid viscosity, and other variables are very considerations taken into account in making a composition which is capable of use in ink-jet applications. For example, jettable fluids must be

capable of flowing through microchannels within the ink cartridge. Additionally, the exit orifice of the ink-jet pen are often less than 200 micrometers. Thus, particulates may tend to clog these microchannels and orifices. Additionally, particulates should not substantially settle in the ink cartridge over extended periods of non-use.

Typically, jettable fluids must have relatively low viscosities in order to achieve such flow. Viscous inks used for silk screening and other printing methods are not functional under constrained by this criteria.

Even if a composition of Mauro could be made to be less viscous and spray applied, standard spray applicators are much more forgiving with respect to reliability than a pen designed to digitally jet an image. Standard spray applicators are also typically more random in their application, and do not provide for digital imagery application.

With respect to Noguchi, the Applicants concede that the reference teaches ink-jetting on ceramics. See col. 1, ln. 48-55. However, the process in Noguchi is not compatible with that in Mauro. Noguchi teaches application of a special coating material to a substrate, which is then subjected to ultraviolet-light to cure the material by photopolymerization. More specifically, Noguchi teaches applying a photopolymerizable monomer of a cationic polyacrylol compound having two or more acrylol groups, as shown by the formula within the patent, and the photopolymerizable material is cured by irradiation with active energy rays, which are ultraviolet rays or electron rays. See col. 2, ln. 50 through col. 4, ln. 44. This surface is what is used to print the ink-jet ink thereon.

Noguchi does not teach the photopolymerizable material disclosed therein can withstand the heat associated with firing taught by Mauro. To the contrary, Noguchi teaches that its photopolymerizable material composition can be dried at a mere 80° C

for 10 minutes (which does not initiate photopolymerization as this process is followed by irradiating the composition with ultraviolet rays at an integrated dose of 200 mJ/cm²). Further, the examples also support this contention. Other substrates are also disclosed for printing in Noguchi which clearly cannot be fired, such as plastic and paper. The same process used for printing on ceramics is also used to print on these meltable and flammable substrates. This indicates that Noguchi does not even contemplate the firing of its composition. Firing is only taught by Mauro, and although Mauro does not explicitly define the temperature requirement of firing, the instant application discloses what is meant by the term firing, which is defined as "heated in an oven or a kiln at from 571° C (the inversion temperature of quartz) to 1400° C." See pg. 11, ln. 23-24.

The combination of Mauro and Noguchi is believed to be improper with respect to the claims before the Examiner. The Examiner has admitted in the Office Action received that Mauro fails to teach the use of an ink-jet printer. Even further, nowhere does Mauro teach, or even suggest, that any of its compositions can be jetted, such as from an ink-jet pen. It is for this purpose that Noguchi has been asserted. Noguchi provides the teaching of ink-jet printing on ceramic materials.

It is respectfully submitted that the Examiner has misunderstood Noguchi, as its teachings are directed to a photopolymerizable coating that is cured by ultraviolet light. There is nothing in Noguchi that teaches firing, or that the taught compositions could even withstand or benefit from the intense heat associated with firing, as defined by the instant application. As such, there is no motivation to combine Mauro and Noguchi to arrive at the instant invention.

Another requirement necessary to sustain an obviousness rejection is that a proposed modification of the prior art must also have had a reasonable expectation of

success from the perspective of one skilled in the art at the time the invention was made. There is no expectation, particularly after considering Mauro, that a composition like that in Mauro would be jettable. In fact, Mauro refers to the colorant material as being "thickened." It is not evident how one could look to Mauro and hope to be able to obtain a jettable composition, particularly when ink-jet applications are known to have difficulty with materials having a thick consistency. Further, with respect to Noguchi, there would be no expectation of success in taking the photopolymerizable composition applied to a ceramic and cured by ultraviolet light prior to ink-jetting, and then subjecting the article to firing, as required by Mauro. It is not evident how one could look to Noguchi and hope to be able to obtain a jettable composition applied to a ceramic without the photopolymerizable coating, which is also configured to be fired as in Mauro or the instant application. Accordingly, there is no expectation of success or arrival at the instant invention upon combination of Mauro and Noguchi.

The only way the references Mauro and Noguchi could have been combined is through impermissible hindsight analysis. It appears that the claims were reviewed, each of the elements were "found" in the prior art in various separate places, and then the elements were woven together to arrive at the present invention. This piecemeal type of analysis is clearly not proper, as the only way to bring these elements together is by first reading the Applicants' own disclosure. This is not appropriate and cannot provide the basis for making a rejection. Part of the invention is that the Applicants have combined elements from two areas, i.e., ink-jet arts and ceramic arts, that have previously been thought to be incompatible in the manner taught by the instant application.

Thus, the Examiner is respectfully requested to reconsider the rejections, and allow claims 1-5 accordingly. Further, inasmuch as claims 6-8 depend from claim 1, these claims are also thought to be allowable. This is particularly true since Yokoyama, Daniels, and Gelbart (the secondary references) do not add anything to the analysis of claim 1, i.e., all drawn to more conventional ink-jet ink inventions unrelated to ceramics and other substrates configured for firing.

Mauro in view of Noguchi and Yamazaki

Claims 9-13 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mauro in view of Noguchi and Yamazaki. Similar to claim 1, a step of jetting chromophore-containing fluid is present, and a step of firing the article is present. The Examiner has not cited a reference or a combination of references that teach the ability to accomplish both of these steps, nor would it be proper to cite Noguchi (or any other typical ink-jet ink reference) as per the discussion above.

Additionally, an added requirement that the chromophore-containing fluid is jetted to a transfer medium, provides a further element that is distinguishable. The fact that the Examiner has stated that Yamazaki teaches a transfer medium does not seem particularly relevant. The Applicants do not claim to be the inventors of the transfer medium *per se*. For example, transfer mediums are used to make iron-on T-shirts. However, nowhere does the prior art teach the jetting of chromophores to a transfer medium, to be further adhered to an article and fired. In order to maintain a rejection of even the element containing the transfer medium, the Examiner would have to point to a suggestion in Mauro or Noguchi that would teach one skilled in the art to look to Yamazaki for such a step. Further, in light of the previous discussion of Noguchi, the Examiner would have to point to a suggestion in Noguchi that the compositions could be applied by some other means than by direct jetting. This,

coupled with the fact that the jetting step is in no way suggested by Mauro, and firing an ink-jetting article is in no ways suggested by Noguchi, provides a basis for allowing claims 9-13. Reconsideration is respectfully requested.

Further, inasmuch as claims 14 and 15 depend from claim 13, these claims are also thought to be allowable. This is particularly true since Yokoyama and Daniels (the secondary references) do not add anything to the analysis, as all are drawn to more conventional ink-jet ink inventions unrelated to ceramics and other substrates configured for firing. Accordingly, it is respectfully requested that rejections to claims 14 and 15 be withdrawn as well.

In view of the foregoing, Applicants believe that claims 1-15 present allowable subject matter and allowance is respectfully requested. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be alleviated during a telephone interview, the Examiner is invited to telephone Gary Oakeson at (801) 566-6633, or Brad Haymond at (541) 715-0159, so that such issues may be resolved as expeditiously as possible.

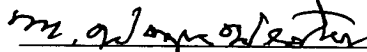
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Respectfully submitted,



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